



PATENT ABSTRACTS OF JAPAN

(11) Publication number: **06029611 A**(43) Date of publication of application: **04.02.94**

(51) Int. Cl

H01S 3/18(21) Application number: **03329099**(22) Date of filing: **12.12.91**(30) Priority: **28.12.90 JP 02416930**(71) Applicant: **NEC CORP**(72) Inventor: **SUGIMOTO MITSUNORI****(54) SURFACE LIGHT EMITTING SEMICONDUCTOR LASER****(57) Abstract:**

PURPOSE: To enable the electric resistance in DBR reflecting film base to be lowered without decreasing the differential quantum efficiency by increasing the impurity concentration in the part near the hetero junction with a multilayer GaAs/AlAs film to be brought into an inverse bias state.

CONSTITUTION: The hetero junction 17 and the nearby part thereof having the forbidden band width E_g fluctuating from small value to large value from multilayer interference reflection film 2 and 4 to respective active regions 3 out of GaAs/AlAs hetero junction are doped with Si and Be in high concentration. At this time, the doped hetero junction 17 in high concentration is to be inverse-biased in the state wherein the space between the electrodes 6 and 7 of the title surface beam emitting semiconductor laser is impressed with a DC voltage in the normal direction. Through these procedures, the part near the hetero junction 17 to be inverse-biased is doped with impurities in high concentration facilitating the current running for making the high resistance avoidable. Furthermore, the effect of beam absorption due to the free carrier in the high concentration doped

region 18 can be suppressed to the minimum thereby enabling the deterioration in the differential quantum efficiency to be avoided.

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